

Amendment under 37 C.F.R. §1.111
Serial No. 09/982,964
Attorney Docket No. 011361

REMARKS

Claims 5, 7-10 and 12-14 are pending. Claims 5 and 7-10 are amended, claims 13 and 14 are added.

Claim 5 was rejected under 35 U.C.S. §103(a) as being unpatentable over **Adourian et al.**, in view of **Smith et al.**, **Burd** and **Kambara**. Claim 7 was rejected under these references further in view of **Manian et al.** Favorable reconsideration of these rejections is requested in view of the amendments made herein and the following remarks.

The Examiner acknowledges the deficiencies of **Adourian et al.** in the first full paragraph on page 4 of the Office Action. **Smith et al.** is applied by the Examiner for its disclosure of a fluorescent light-detecting device. The Examiner argues that one of ordinary skill in the art would have modified **Adourian et al.** to employ the light source and optics of Smith et al. “because **Smith et al.** teach the usefulness of this scanning detector in efficiently monitoring multiple separation lanes.”

One of ordinary skill in the art would not have been motivated to make the modifications suggested by the Examiner. **Adourian et al.** discloses a microchip 120 having a rotary geometry with embedded channels 194. A detector 202 is provided as illustrated in Fig. 11B.

Amendment under 37 C.F.R. §1.111
Serial No. 09/982,964
Attorney Docket No. 011361

In contrast to the plate-shaped microchip of **Adourian et al.**, **Smith et al.** provides an assembly (array 130) of a plurality of capillary ropes 112. See Figs. 1A and 1B of Smith et al. which respectively illustrate schematic side and top views of the array. The array 130 is clearly different from the plate-shaped member of the present invention.

One of ordinary skill in the art would not have been motivated to look to the teachings of Smith et al. and modify **Adourian et al.** in the manner suggested by the Examiner since the microchip illustrated in Fig. 11A and 11B is so structurally dissimilar from the array 130 disclosed by **Smith et al.**

In addition, the optical detection system 101 of **Smith et al.** provides a detection region 118 which interrogates the contents of the capillary close to an outlet end 116. Thus, the combination of **Adourian et al.** and **Smith et al.** would not teach the claimed specimen-injection monitor mechanism.

Burd is cited by the Examiner for allegedly rendering it obvious to include “a separately-installed detector for specimen-injection monitoring.” The Examiner argues that **Burd** teaches the usefulness of such an injection monitor in coordinating other functions of the apparatus.

Amendment under 37 C.F.R. §1.111
Serial No. 09/982,964
Attorney Docket No. 011361

Burd teaches a system in which short capillary segments 53 can be introduced sequentially into a separation capillary 11, or capillary segments 18 can be collected. The separation capillary can be provided with a window 60 for detection toward a downstream end of the capillary 11 and a window 61 at an upstream side to monitor sample injection.

The Examiner cites **Kambara** for allegedly rendering it obvious to use a single light source with a beam splitter for the plural detectors disclosed by **Burd**. However, it is unclear how one of ordinary skill in the art would have been able to make the modifications of **Smith et al.** and **Burd** so as to provide a single light source. That is, **Smith et al.** provides a u-shaped capillary 12. If a detector is placed at an upstream portion near the inlet 114, it is unclear how one of ordinary skill would be capable to modify the detector of **Smith et al.** so as to provide a single light source. The modification appears to be based upon impermissible hindsight.

In order to more clearly distinguish over the cited art, claims 5 and 7 have been amended as follows.

Each passage is restricted to the cross-channel type passage which comprises a specimen-injection-passage and a separation-passage intersecting with each other. The cross-channel type passage is clearly supported by Fig. 7.

Amendment under 37 C.F.R. §1.111
Serial No. 09/982,964
Attorney Docket No. 011361

The specimen-injection monitor mechanism is provided with CCD for detecting the specimen injected in the specimen-injection-passage so that the specimen-injection monitor mechanism can detect a specimen distribution along the specimen-injection-passage. The CCD 85 is clearly supported by Figs. 5, 10 and their descriptions.

The electrophoresis apparatus with the cross-channel type passage such as the present invention can control the sample amount introduced in the separation-passage more accurately than the capillary electrophoresis apparatuses such as those disclosed by **Burd** in which the sample is introduced directly to one end of the separation-passage. Here, in order to control the sample amount introduced in the separation-passage accurately, it is necessary that the sample is distributed uniformly throughout the specimen-introducing passage at least including the intersection between the specimen-injection passage and the separation passage, and then the sample at the intersection is injected certainly into the separation passage. See page 17, line 24 to page 18, line 7 of the specification.

In the present invention with the CCD, the uniformity of the sample distribution along the specimen-injection passage including at least the intersection can be determined from the image obtained by the CCD, and it becomes possible to find the condition for controlling accurately the sample amount to be injected into the separation passage.

Amendment under 37 C.F.R. §1.111
Serial No. 09/982,964
Attorney Docket No. 011361

Claim 7 has been rewritten into independent form. Claim 7 additionally states that the specimen-injection monitor mechanism is provided with a detecting optical system having an LED as a light source. The benefits of using LED as a light source are described on page 28, lines 19 – 25 of the present application.

Claims 8 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over **Adourian et al.**, **Smith et al.**, **Burd**, and **Kambara**, further in view of **Uchigaki et al.**. Favorable reconsideration of this rejection is respectfully requested.

Claim 8 depends from claim 5. **Uchigaki et al.** is applied by the Examiner for its disclosure of an analysis device which includes means for shutting down an analysis in case of an error. However, the teachings of **Uchigaki et al.** fail to teach the features required by claim 8. Claim 8 requires a control part which (a) causes the voltage applying part to supply a voltage for guiding a specimen to an intersection between the specimen injection passage and the separation passage, and (b) stops the voltage application to the passages upon the specimen-injection monitor mechanism detecting a non-uniform specimen distribution in a predetermined area after a predetermined time has elapsed. The voltage applying part applies a voltage across the passage of the electrophoretic member. **Uchigaki et al.** does not disclose such features. Instead, **Uchigaki et al.** provides further sensors 160 and 161 which generate L and H level signals. **Uchigaki et al.** does not provide a control part which causes the voltage applying part to supply a

Amendment under 37 C.F.R. §1.111
Serial No. 09/982,964
Attorney Docket No. 011361

voltage for guiding a specimen to an intersection between the specimen injection passage and the separation passage.

Additionally, the electrophoretic member of **Uchigaki et al.** is quite different from that of present invention. One of ordinary skill in the art would not have found the claimed invention obvious by combining such a large number of references in the manner suggested by the Examiner.

Claims 10 and 12 were rejected under 35 U.S.C. §103(a) as being unpatentable over **Adourian et al.** in view of **Menchen et al.** The Examiner argues that the use of a multi-tip pipetter would suggest filling each injection port 126 simultaneously.

In order to further clarify the differences between the invention and cited art, claim 10 is further amended to set forth that the buffer liquid is inserted into all reservoirs of one electrophoretic member simultaneously so as to mitigate an influence of a water head difference.

Amendment under 37 C.F.R. §1.111
Serial No. 09/982,964
Attorney Docket No. 011361

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP



Stephen G. Adrian

Attorney for Applicants
Registration No. 32,878
Telephone: (202) 822-1100
Facsimile: (202) 822-1111

SGA/asc